# UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 73533

CSAH NO. 71

OVER THE

SAUK RIVER

DISTRICT 3 - STEARNS COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 87)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 73533, Piers 1 and 2, were in good condition with no structurally significant defects observed. A minor accumulation of timber debris was observed on the channel bottom along the north side of Pier 2. The channel bottom appeared to be in stable condition with no evidence of significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

(A) The concrete of the piers was in good and sound condition with no notable defects.

(B) A minor accumulation of timber debris consisting of branches 3 inches in diameter and smaller was observed around the upstream nose of Pier 2.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 73533

Feature Crossed: Sauk River

Feature Carried: CSAH No. 71

Location: District 3 - Stearns County

Bridge Description: The superstructure consists of three spans of multiple steel beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The footings of both the abutments and piers are supported by concrete piles. The piers are numbered 1 and 2 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 19, 2007

Weather Conditions: Partly Cloudy, 50°F

Underwater Visibility: 1.0 foot

Waterway Velocity: Negligible/None.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers each consist of five cylindrical concrete columns connected by a reinforced concrete diaphragm extending from the top of the pier down 10 feet. The columns sit on a common rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 11.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the west end of Pier 2.

Water Surface: The waterline was approximately 9.9 feet below reference.
Waterline Elevation = 1086.4.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/10/07

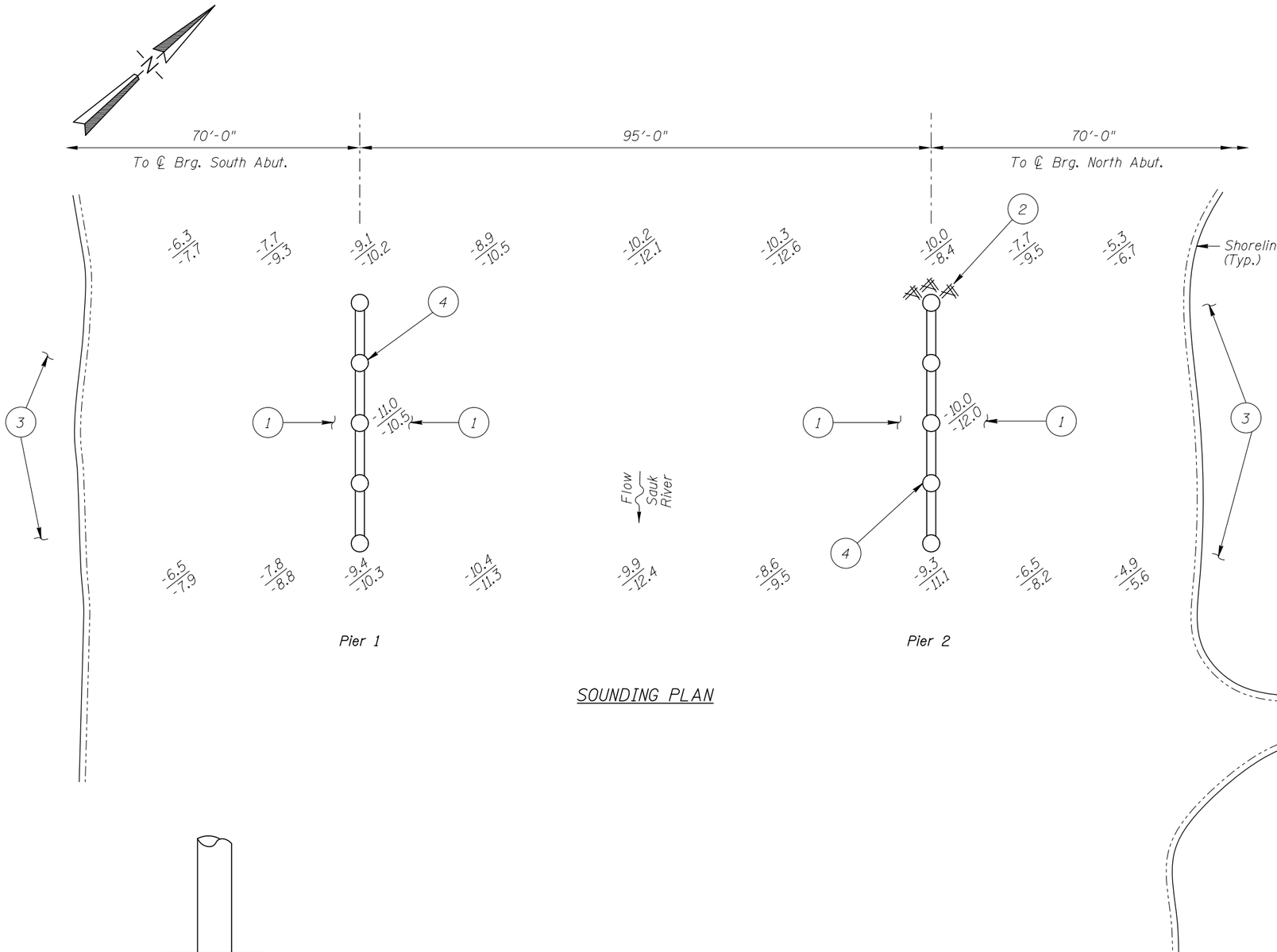
Item 113: Scour Critical Bridges: Code I/95

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

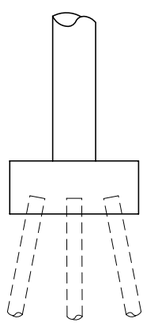
_____ Yes X No

Photograph 1. View of Pier 1, Looking Northeast.

Photograph 2. View of Pier 2, Looking North.




SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on October 18, 2007, the waterline was located approximately 9.9 feet below the top of the pier cap at the upstream end of Pier 2. This corresponds to a waterline elevation of 1086.4.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

1. The channel bottom consisted of silty sand with up to 6 inches of probe rod penetration.
2. A light accumulation of timber debris was observed at the upstream end of Pier 2, consisting of 3-inch-diameter and smaller branches.
3. The embankments consisted of grouted riprap up to 2 feet in diameter.
4. The concrete was generally smooth and sound and exibited a light layer of aquatic growth below the waterline.

Legend

| | |
|---|---|
| -2.0 / -5.2 | Sounding Depth (10/18/07) / Sounding Depth (9/28/02) |
| | Timber Debris |

Note:

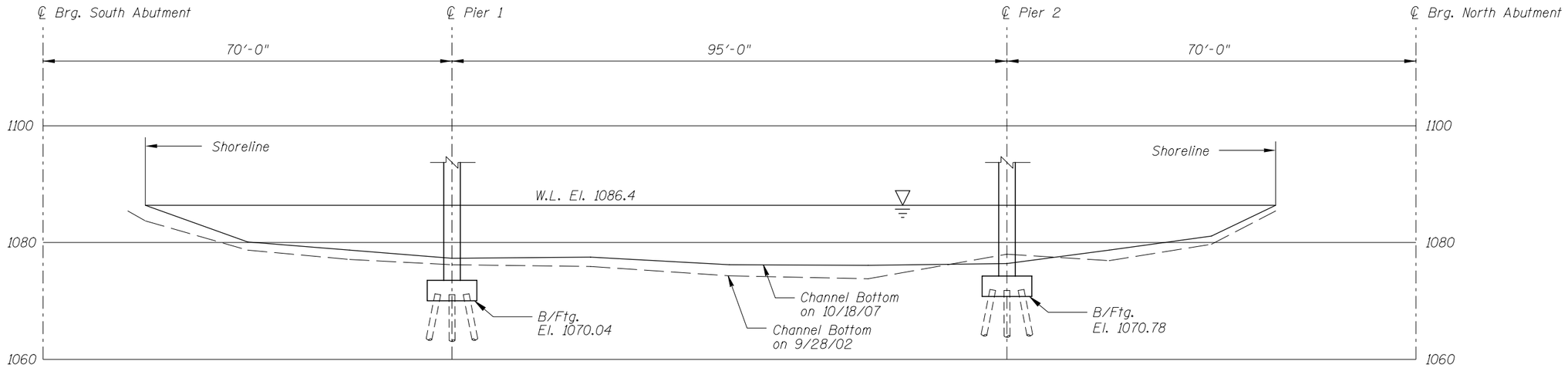
All soundings based on 2007 waterline location.

**MINNESOTA**
**DEPARTMENT OF TRANSPORTATION**
**UNDERWATER BRIDGE INSPECTION**

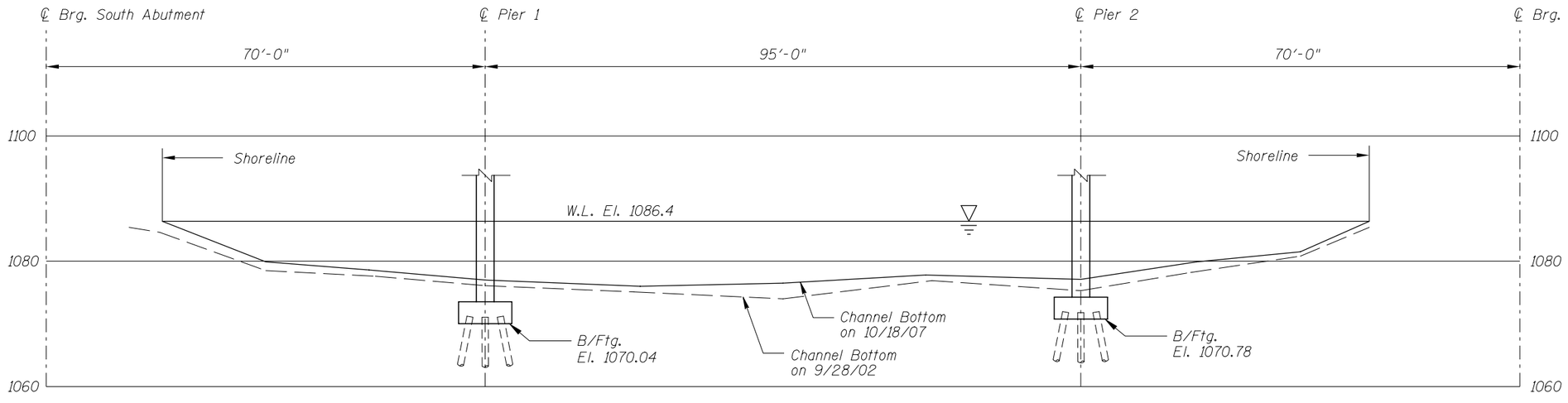
STRUCTURE NO. 73533
OVER THE SAUK RIVER
DISTRICT 3, STEARNS COUNTY

INSPECTION AND SOUNDING PLAN

| | | |
|---|---|---|
| Drawn By: PRH | COLLINS ENGINEERS, Inc. 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com | Date: OCT., 2007 |
| Checked By: MDK | | Scale: NTS |
| Code: 52210087 | | Figure No.: 1 |




UPSTREAM FASCIA PROFILE




DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

**MINNESOTA**
**DEPARTMENT OF TRANSPORTATION**
**UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 73533
OVER THE SAUK RIVER
DISTRICT 3, STEARNS COUNTY

UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

| | | |
|---|---|---|
| Drawn By: PRH | COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-0300 www.collinsengr.com | Date: OCT., 2007 |
| Checked By: MDK | | Scale: 1"=20' |
| Code: 52210087 | | Figure No.: 2 |

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 19, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 73533 WEATHER: Partly Cloudy, 50°F

WATERWAY CROSSED: Sauk River

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

_____ OTHER _____

PERSONNEL: Clayton G. Brookins, Valerie Roustan

EQUIPMENT: Scuba, Scraper, Sounding Pole, Probe Rod, Lead Line, Camera

TIME IN WATER: 1:40 p.m.

TIME OUT OF WATER: 2:10 p.m.

WATERWAY DATA: VELOCITY Negligible/None

VISIBILITY 1.0 foot

DEPTH 11 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete was sound and in good condition with no notable defects. A minor accumulation of branchy timber debris was observed around the upstream nose of Pier 2. The channel bottom appeared to be in stable condition with no appreciable changes since the previous inspection.

FURTHER ACTION NEEDED: _____ YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

# UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 73533
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Sauk River

INSPECTION DATE October 19, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

## CONDITION RATING

| | | | SUBSTRUCTURE | | | | | | CHANNEL | | | | | GENERAL | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNIT REFERENCE NO. | | MAXIMUM DEPTH OF WATER | PILING | COLUMNS, SHAFTS, OR FACES* | FOOTINGS | DISPLACEMENT | OTHER | OVERALL SUBSTRUCTURE CONDITION CODE* | SCOUR | EMBANKMENT EROSION | EMBANKMENT PROTECTION | OTHER (DRIFT/DEBRIS) | OVERALL CHANNEL & PROTECTION CONDITION | CONCRETE | STEEL | TIMBER | LOSS OF SECTION | PREVIOUS REPAIR OR MAINTENANCE | OTHER |
| | UNIT DESCRIPTION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | Pier 1 | 11.0’ | N | 7 | N | 9 | N | 7 | 8 | 8 | 8 | N | 8 | 7 | N | N | N | N | N |
| | Pier 2 | 10.0’ | N | 7 | N | 9 | N | 7 | 8 | 8 | 8 | 7 | 7 | 7 | N | N | N | N | N |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was sound and in good condition with no notable defects. A minor accumulation of branchy timber debris was observed around the upstream nose of Pier 2. The channel bottom appeared to be in stable condition with no appreciable changes since the previous inspection.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.